

Patent claims

1. An intaglio printing plate (1) for all-over printing of contiguous printed image areas, the printed image being incorporated into the printing plate surface (2) in the form of an engraving (3), characterized in that partitions (4) are provided in the engraved, ink-receiving areas so as to divide said engraved areas into partial areas, said partitions (4) being designed so as not to have any areas at the level of the printing plate surface.
2. A printing plate according to claim 1, characterized in that the engraved areas are engraved lines and/or large-area engraved elements.
3. A printing plate according to claim 2, characterized in that the engraved lines are wider than 0.5 millimeters, preferably wider than 1.0 millimeter.
4. A printing plate according to any of claims 1 to 3, characterized in that the engraved areas are engraved lines, and the partitions (4) extend transversely to the engraved line so as to form adjacent partial portions, and the partitions (4) extend transversely or diagonally to the wiping direction.
5. A printing plate according to any of claims 1 to 3, characterized in that the engraved areas are engraved lines, and the partitions extend parallel to the engraved line and transversely or diagonally to the wiping direction.
6. A printing plate according to claim 1, characterized in that the partitions (4) are disposed in the engraved area so as to form a uniform fine structure in the form of a screen or regular pattern.
7. A printing plate according to claim 1 or 6, characterized in that the screen is a line screen or cross-line screen.
8. A printing plate according to claim 7, characterized in that the cross-line screen consists of a first engraving with parallel, preferably straight, engraved lines and a second engraving with parallel, preferably straight, engraved lines superimposed on the first engraving.
9. A printing plate according to claim 8, characterized in that the lines of the first and second engravings form with each other an angle between 20° and 90°, in particular 40° to 70°.

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10. A printing plate according to any of claims 1 to 9, characterized in that the upper edges of the partitions (4) are disposed at a mutual distance (d) which is greater than or equal to the contact width of an engraving tool used for engraving the engraved area.
 11. A printing plate according to any of claims 1 to 10, characterized in that the mutual distance (d) of the upper edges (5) of the partitions is smaller than 500 microns.
 12. A printing plate according to claim 11, characterized in that the mutual distance (d) of the upper edges (5) of the partitions (4) is 20 microns to 150 microns.
 13. A printing plate according to claim 12, characterized in that the mutual distance (d) of the upper edges (5) of the partitions (4) is 50 microns..
 14. A printing plate according to any of claims 1 to 13, characterized in that the upper edges (5) of the partitions (4) have a lowering (α) of at least 2 microns to 5 microns over the printing plate surface (2).
 15. A printing plate according to any of claims 1 to 14, characterized in that the partitions (4) have a partition height (b) in the range of 3 microns to 150 microns.
 16. A printing plate according to claim 15, characterized in that the partition height (b) is in the range of 8 microns and 60 microns.
 17. A printing plate according to claim 15 or 16, characterized in that the ratio ($b:t$) between partition height (b) and engraving depth (t) is in the range of 0.5 to 1.
 18. A printing plate according to any of claims 1 to 17, characterized in that the engraving depth (t) is between 5 microns and 150 microns.
 19. A printing plate according to claim 18, characterized in that the engraving depth (t) is between 10 microns and 60 microns.
 20. A printing plate according to any of claims 1 to 19, characterized in that the partitions (4) have flanks with flank angles (α) in the range of 15° to 60° based on the perpendicular to the printing plate surface (2).
 21. A printing plate according to claim 20, characterized in that the partitions (4) have flanks with flank angles (α) in the range of 30° to 50° .

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22. A printing plate according to any of claims 1 to 21, characterized in that the partitions (4) form a linear fine structure through their parallel arrangement.
 23. A printing plate according to claim 22, characterized in that the printing plate (1) is adapted for use with a printing cylinder such that the linear fine structure is substantially parallel to the rotation axis of the printing cylinder.
 24. A printing plate according to any of claims 1 to 23, characterized in that both the length and the width of the engraved area are more than one millimeter.
 25. A printing plate according to any of claims 1 to 24, characterized in that at least a first engraved area and a second engraved area are provided which differ by different designs of the partitions (4) and/or partition arrangements.
 26. A printing plate according to claim 25, characterized in that the partitions (4) in the first engraved area have a different orientation from the partitions (4) in the second engraved area.
 27. A printing plate according to claim 26, characterized in that the partitions (4) in the first engraved area are aligned at right angles to the partitions (4) in the second engraved area.
 28. A printing plate according to any of claims 25 to 27, characterized in that the first engraved area has a different engraving depth (t) from the second engraved area.
 29. A printing plate according to any of claims 25 to 28, characterized in that the upper edges (5) of the partitions in the first engraved area have a greater mutual distance (d) than the upper edges (5) of the partitions in the second engraved area.
 30. A printing plate according to any of claims 25 to 29, characterized in that the upper edges (5) of the partitions in the second engraved area have a greater distance (a) from the printing plate surface (2) than the upper edges (5) of the partitions in the first engraved area.
 31. A printing plate according to any of claims 25 to 30, characterized in that the first and second engraved areas adjoin each other.
 32. A data carrier with a printed image produced by the intaglio printing process and comprising at least one printed image area having an ink layer and a surface

area of more than one square millimeter, the at least one ink layer covering the complete printed image area, characterized in that the lateral dimensions such as length and width of the area are greater than 0.5 millimeters, and the ink layer has along one direction at least one notch on which the ink layer thickness passes through a minimum.

33. A data carrier according to claim 32, characterized in that the lateral dimensions such as length and width of the area are greater than one millimeter.
34. A data carrier according to claim 32 or 33, characterized by a surface relief of the at least one ink layer, the surface relief having a fine structure with regularly recurring structural elements.
35. A data carrier according to claim 34, characterized in that the structural elements recur at a distance smaller than 0.5 millimeters.
36. A data carrier according to claim 34 or 35, characterized in that the fine structure forms a screen or regular pattern.
37. A data carrier according to claim 36, characterized in that the screen is a line screen or cross-line screen.
38. A data carrier according to claim 36 or 37, characterized in that the fine structure forms a screen wherein the line width is less than 150 microns.
39. A data carrier according to any of claims 34 to 38, characterized by at least a first printed image area with a first fine structure and a second printed image area with a second fine structure different from the first fine structure.
40. A data carrier according to claim 39, characterized in that the first and second printed image areas represent one or more characters or a picture.
41. A data carrier according to claim 39 or 40, characterized in that the fine structure of the first printed image area has a different orientation from the fine structure of the second printed image area.
42. A data carrier according to any of claims 39 to 41, characterized in that the fine structures of the first and the second printed image areas differ by different line widths.
43. A data carrier according to any of claims 39 to 42, characterized in that the first and second printed image areas differ by different ink layer thicknesses.

44. A method for producing an intaglio printing plate (1) for all-over printing of a large area by the intaglio printing process comprising the steps of:
- providing a printing plate with a printing plate surface (2), and
 - engraving at least one engraved area corresponding to the large area to be printed into the printing plate surface (2) by means of an engraving tool so as to leave partitions (4) rising up in the engraved area and dividing the engraved area into partial areas, the partitions (4) being designed by the engraving so as not to have any areas at the level of the printing plate surface (2).
45. A method according to claim 44, characterized in that the engraved areas are engraved as engraved lines and/or large-area engraved elements.
46. A method according to claim 45, characterized in that the engraved lines are wider than 0.5 millimeters, preferably wider than 1.0 millimeter.
47. A method according to any of claims 44 to 46, characterized in that the engraved areas are engraved as engraved lines, and the partitions (4) extend transversely to the engraved line so as to form adjacent partial portions, and the partitions extend transversely or diagonally to the wiping direction.
48. A method according to any of claims 44 to 46, characterized in that the engraved areas are engraved as engraved lines, and the partitions are formed parallel to the engraved line and extend transversely or diagonally to the wiping direction.
49. A method according to claim 44, characterized in that the partitions (4) form a uniform fine structure in the form of a screen or regular pattern.
50. A method according to claim 49, characterized in that the screen is a line screen, dot screen or cross-line screen.
51. A method according to claim 50, characterized in that the cross-line screen is formed of a first engraving with parallel, preferably straight, engraved lines and a second engraving with parallel, preferably straight, engraved lines superimposed on the first engraving.

52. A method according to claim 51, characterized in that the lines of the first and second engravings form with each other an angle between 20° and 90°, in particular 40° to 70°.
53. A method according to any of claims 44 to 50, characterized in that the partitions (4) are produced with flank angles (α) in the range of 15° to 60° based on the perpendicular to the printing plate surface (2).
54. A method according to claim 53, characterized in that the partitions are produced with flank angles (α) in the range of 30° to 50°.
55. A method according to claim 53 or 54, characterized in that an engraving tool with a corresponding flank angle (α) is used for engraving.
56. A method according to claim 55, characterized in that a tapered rotating chisel is used for engraving.
57. A method according to any of claims 44 to 56, characterized in that a first engraving is engraved into the printing plate surface (2), and a second engraving is engraved into the printing plate surface (2) adjacent to the first engraving so as to leave between the first and second engravings a partition (4) tapering at the level of the printing plate surface (2) or slightly therebelow.
58. A method according to any of claims 44 to 57, characterized in that 2 microns to 5 microns of the printing plate surface material is removed in the engraved area before or after producing partitions (4).
59. A method according to any of claims 44 to 58, characterized in that the mutual maximum distance (d) of the partitions (4) is smaller than 500 microns.
60. A method according to claim 59, characterized in that the mutual maximum distance (d) of the partitions (4) is 20 microns to 150 microns.
61. A method according to any of claims 44 to 60, characterized in that partitions (4) with different heights are provided within an engraving.
62. A method according to any of claims 44 to 60, characterized in that the engraved area engraved into the printing plate surface (2) has an engraving depth in the range of 5 microns to 150 microns.
63. A method according to claim 62, characterized in that the engraving depth is in the range of 10 microns to 60 microns.

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64. A method according to any of claims 49 to 63, characterized in that the partitions (4) form a linear fine structure through their parallel arrangement.
 65. A method according to any of claims 49 to 64, characterized in that a first fine structure is engraved in at least a first engraved area, and a second fine structure different from the first fine structure is engraved in at least a second engraved area.
 66. A method according to claim 65, characterized in that the partitions (4) in the first engraved area are produced with a different orientation from the partitions (4) in the second engraved area.
 67. A method according to claim 66, characterized in that the partitions (4) in the first engraved area are aligned at right angles to the partitions (4) in the second engraved area.
 68. A method according to any of claims 65 to 67, characterized in that the first engraved area is engraved with a different engraving depth (t) from the second engraved area.
 69. A method according to any of claims 65 to 68, characterized in that the partitions (4) in the first engraved area are disposed at a greater maximum mutual distance (d) than the partitions in the second engraved area.
 70. A method according to any of claims 65 to 68, characterized in that the partitions (4) in the first engraved area are disposed at a greater maximum mutual distance (d) than the partitions in the second engraved area.
 71. A method according to any of claims 65 to 70, characterized in that the upper edges (5) of the partitions (4) in the first engraved area are produced at a greater distance (a) from the printing plate surface (2) than the upper edges (5) of the partitions in the first engraved area.
 72. An intaglio printing process for all-over printing of contiguous printed areas using a printing plate (1) according to any of claims 1 to 31